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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,035	11/26/2003	Edouard Lamboray	MERL-1520	1787

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MITSUBISHI ELECTRIC RESEARCH LABORATORIES, INC.
201 BROADWAY
8TH FLOOR
CAMBRIDGE, MA 02139

EXAMINER	
WONG, ALLEN C	

ART UNIT	PAPER NUMBER
2621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/723,035	LAMBORAY ET AL.	
	Examiner	Art Unit	
	Allen Wong	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-22 and 24 is/are rejected.

7)☒ Claim(s) 23 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 26 November 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 4/11/05, 11/26/03.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-18 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Panusopone (6,483,874) in view of Carlbom (7,203,693).

Regarding claim 1, Panusopone discloses a system for encoding a plurality of videos acquired of a moving object in a scene by a plurality of fixed cameras, comprising:

means for determining a segmentation mask for each frame of each video, the segmentation mask identifying only pixels in the frame associated with the object (col.5, ln.29-42, segmentation masks are used for video frames that identify pixels associated with the video object);

a shape encoder configured to encode the segmentation masks (fig.2, element 210, col.5, ln.47-48);

a position encoder configured to encode a position of each pixel (fig.2, element 220, col.5, ln.48-50, motion data is coded to code a position of each pixel in a frame); and

a color encoder configured to encode a color of each pixel (fig.2, element 240, col.5, ln.50-53).

Panusopone does not specifically disclose means for determining camera calibration data of each camera and means for associating the camera calibration data of each camera with the video acquired by the camera. However, Carlbom teaches means for determining camera calibration data of each camera (fig.2B, Carlbom discloses element 252 that determines the camera calibration data, see col.8, ln.56-61) and means for associating the camera calibration data of each camera with the video acquired by the camera (col.8, ln.56-61; Carlbom discloses that each camera has a unique identifier, ie. a camera ID, and its calibration parameters associated with 3D position, dimensions, orientation, zoom, focus and viewing volume). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Panusopone and Carlbom, as a whole, for producing high quality images of an observed real world event (Carlbom col.2, ln.28-31).

Regarding claim 2, Panusopone discloses the multiplexer for combining outputs of the shape encoder, the position encoder, and the color encoder into a single bitstream (fig.2, element 280).

Regarding claims 3-5 and 12-14, Panusopone discloses further comprising: a decoder (fig.3, element 300); means for transferring the bitstream to the decoder (fig.2, element 280 multiplexes the bitstream and prepares the transportation of the bitstream to send to decoder 300 on fig.3). Panusopone does not specifically disclose rendering a decoded bitstream from an arbitrary viewpoint using the camera calibration data. However, Carlbom teaches the use of camera calibration data (col.8, ln.56-61; Carlbom discloses that each camera has a unique identifier, ie. a camera ID, and its

calibration parameters associated with 3D position, dimensions, orientation, zoom, focus and viewing volume). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Panusopone and Carlbom, as a whole, for producing high quality images of an observed real world event (Carlbom col.2, ln.28-31).

Regarding claims 6 and 11, Panusopone does not disclose further comprising: means for maintaining a dynamic 3D point model defining a geometry of the moving object. However, Carlbom teaches the use of a dynamic 3D model (col.9, ln.22-43). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Panusopone and Carlbom, as a whole, for producing high quality images of an observed real world event (Carlbom col.2, ln.28-31).

Regarding claim 7, Panusopone does not specifically disclose in which each point of the dynamic 3D point model is associated with an identifier of one or more of the plurality of cameras. However, Carlbom teaches in which each point of the dynamic 3D point model is associated with an identifier of one or more of the plurality of cameras (col.8, ln.56-61; Carlbom discloses that each camera has a unique identifier, ie. a camera ID, and its calibration parameters associated with 3D position, dimensions, orientation, zoom, focus and viewing volume). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Panusopone and Carlbom, as a whole, for producing high quality images of an observed real world event (Carlbom col.2, ln.28-31).

Regarding claims 8, 10, 16 and 17, Panusopone discloses in which the segmentation masks are encoded using MPEG-4 lossless binary shape encoding, the positions include depth values encoded as quantized pixel luminance values, and the colors are encoded using MPEG-4 video object coding (col.4, ln.58 to col.5, ln.12).

Regarding claim 9, Panusopone does not specifically disclose in which the camera calibration data are updated periodically when any of the fixed cameras are relocated. However, Carlbom teaches the camera calibration data are updated periodically when any of the fixed cameras are relocated (fig.4, element 412). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Panusopone and Carlbom, as a whole, for producing high quality images of an observed real world event (Carlbom col.2, ln.28-31).

Regarding claim 15, Panusopone does not specifically disclose in which a playback frame rate of the output video is different than a frame rate used to acquired the videos by the plurality of cameras. However, Carlbom teaches the playback frame rate of the output video is different than a frame rate used to acquire the videos by the plurality of cameras (fig.1, element 120 is a visualization interface can be used to playback the video at a different frame rate than the acquired image rate, ie. fast forward or slow-motion). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Panusopone and Carlbom, as a whole, for producing high quality images of an observed real world event (Carlbom col.2, ln.28-31)

Regarding claims 18 and 20-21, Panusopone discloses further comprising: means for partitioning each video into a plurality of segments, each segment including a plurality of frames (col.6, ln.36-43, interframe coding involves a group of frames); and means for encoding a key frame and difference frames of each segment, using the shape encoder, the position encoder, and the color encoder into a single bitstream (col.6, ln.61 to col.7, ln.6 and col.7, ln.24-26, Panusopone disclose the encoding of the anchor frame or the key frame and the forward and backward MVs are used for obtaining the difference frames, and in fig.2, note the use of a multiplexer 280 to merge the data into a single bitstream from the the shape encoder 210, position encoder 220 and color encoder 240).

Claims 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Panusopone (6,483,874) and Carlbom (7,203,693) in further view of Wu (6,614,936).

Panusopone and Carlbom do not disclose in which the key frames comprise a base layer of an encoded video bitstream, and the difference frames comprise an enhancement layer of the encoded bitstream. However, Wu teaches the base layer (fig.9, element 82) and the enhancement layer (fig.9, element 84). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Panusopone, Carlbom and Wu, as a whole, for accurately, efficiently encoding images in a high quality manner.

Claims 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Panusopone (6,483,874) and Carlbom (7,203,693) in further view of Rusinkiewicz ("Qsplat: A multiresolution point rendering system for large meshes" In SIGGRAPH

2000 Conference Proceedings, ACM Siggraph Annual Conference Series, pages 343-352, 2000).

Panusopone discloses the encoder used to encode images (fig.2). Carlbom discloses the surface normal encoder (col.9, ln.44-55; VRML and MPEG-4 were implemented). Panusopone and Carlbom do not specifically disclose the splat size encoder. However, Rusinkiewicz teaches the use of splat size encoder (page 344, section 2.1 Rendering Algorithms, the Qsplat uses a recursive frame rate encoding scheme for splat size encoding). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Panusopone, Carlbom and Rusinkiewicz, as a whole, for efficiently encoding/decoding image data so as to accurately produce high quality images.

Allowable Subject Matter

3. Claim 23 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art does not specifically disclose "the surface normal vectors are progressively encoded using an octahedron subdivision of a unit sphere and the splat sizes are encoded as quantized codewords represented in a gray scale MPEG video object".

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen Wong whose telephone number is (571) 272-7341. The examiner can normally be reached on Mondays to Thursdays from 8am-6pm Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on (571) 272-7353. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Allen Wong
Primary Examiner
Art Unit 2621

AW
4/30/07